

WHAT IS CLAIMED IS:

1. A method of modifying a two-dimensional, flat fiber morphology of a never-been-dried wood pulp into a three-dimensional twisted fiber morphology, comprising the steps of:

treating a wood pulp fiber slurry with a drying aid; and

thermally drying the wood pulp fiber slurry at a temperature of at least 200 degrees Celsius.

2. The method of Claim 1, wherein the wood pulp fiber slurry is thermally dried at a temperature of at least 250 degrees Celsius.

3. The method of Claim 1, wherein the wood pulp fiber slurry is thermally dried at a temperature of at least 300 degrees Celsius.

4. The method of Claim 1, wherein the wood pulp fiber slurry is subjected to thermal drying for between about 0.1 and about 20 seconds.

5. The method of Claim 1, wherein the drying aid comprises a surfactant.

6. The method of Claim 5, wherein the surfactant is selected from the group consisting of an anionic surfactant, a cationic surfactant, and a

combination of an anionic surfactant, a cationic surfactant, and a non-ionic surfactant.

7. The method of Claim 1, further comprising the step of subjecting the wood pulp fiber slurry to a refining treatment prior to treating the wood pulp fiber slurry with the drying aid.

8. The method of Claim 1, wherein the thermal drying step is carried out using a flash dryer.

9. The method of Claim 8, further comprising the step of fluffing the wood pulp fiber slurry prior to flash drying the wood pulp fiber slurry.

10. The method of Claim 8, further comprising the step of removing water from the wood pulp fiber slurry, up to about 30% to about 50% consistency by weight, prior to flash drying the wood pulp fiber slurry.

11. The method of Claim 1, wherein the thermally dried wood pulp fiber slurry comprises at least 80% twisted fibers.

12. The method of Claim 1, wherein the thermally dried wood pulp fiber slurry comprises at least 85% twisted fibers.

13. The method of Claim 1, wherein the thermally dried wood pulp fiber slurry comprises at least 90% twisted fibers.

14. The method of Claim 1, wherein a water retention value of the wood pulp is at least 0.8 gram water/gram dry fiber as a result of being modified from two-dimensional to three-dimensional.

15. The method of Claim 1, wherein a water retention value of the wood pulp is at least 1.0 gram water/gram dry fiber as a result of being modified from two-dimensional to three-dimensional.

16. The method of Claim 1, wherein a water retention value of the wood pulp is at least 1.1 grams water/gram dry fiber as a result of being modified from two-dimensional to three-dimensional.

17. The method of Claim 1, wherein an average dry fiber twist count of the wood pulp is at least about 2.0 twist nodes per millimeter as a result of being modified from two-dimensional to three-dimensional.

18. The method of Claim 1, wherein an average wet fiber twist count of the wood pulp is at least about 1.5 twist nodes per millimeter as a result of being modified from two-dimensional to three-dimensional.

19. A cellulosic, fibrous material comprising fibers modified according to the method of Claim 1.

20. A method of modifying a two-dimensional, flat fiber morphology of a never-been-dried wood pulp into a three-dimensional twisted fiber morphology, comprising the steps of:

spray drying a wood pulp fiber slurry; and

flash drying the spray dried wood pulp fiber slurry.

21. The method of Claim 20, wherein the flash drying step includes thermally drying the wood pulp fiber slurry at a temperature of at least 180 degrees Celsius.

22. The method of Claim 20, wherein the flash drying step includes thermally drying the wood pulp fiber slurry at a temperature of at least 200 degrees Celsius.

23. The method of Claim 20, wherein the flash drying step includes thermally drying the wood pulp fiber slurry at a temperature of at least 220 degrees Celsius.

24. The method of Claim 20, wherein the wood pulp fiber slurry has a consistency of between about 0.1% and about 10% prior to spray drying the wood pulp fiber slurry.

25. The method of Claim 20, wherein the spray drying is carried out until the wood pulp fiber slurry reaches a consistency of between about 15% and about 50% consistency by weight.

26. The method of Claim 20, further comprising the step of subjecting the wood pulp fiber slurry to a refining treatment prior to spray drying the wood pulp fiber slurry.

27. The method of Claim 20, wherein the flash dried wood pulp fiber slurry comprises at least 80% twisted fibers.

28. The method of Claim 20, wherein the flash dried wood pulp fiber slurry comprises at least 85% twisted fibers.

29. The method of Claim 20, wherein the flash dried wood pulp fiber slurry comprises at least 90% twisted fibers.

30. The method of Claim 20, wherein a water retention value of the wood pulp is at least 0.8 gram water/gram dry fiber as a result of being modified from two-dimensional to three-dimensional.

31. The method of Claim 20, wherein a water retention value of the wood pulp is at least 1.0 gram water/gram dry fiber as a result of being modified from two-dimensional to three-dimensional.

32. The method of Claim 20, wherein a water retention value of the wood pulp is at least 1.1 grams water/gram dry fiber as a result of being modified from two-dimensional to three-dimensional.

33. The method of Claim 20, wherein an average dry fiber twist count of the wood pulp is at least about 2.0 twist nodes per millimeter as a result of being modified from two-dimensional to three-dimensional.

34. The method of Claim 20, wherein an average wet fiber twist count of the wood pulp is at least about 1.5 twist nodes per millimeter as a result of being modified from two-dimensional to three-dimensional.

35. A cellulosic, fibrous material comprising fibers modified according to the method of Claim 20.

36. A method of modifying a two-dimensional, flat fiber morphology of a slurry of a hydrophilic material into a three-dimensional twisted fiber morphology, comprising the steps of:

spray drying a slurry of a hydrophilic material; and

flash drying the spray dried slurry of the hydrophilic material.

37. The method of Claim 36, wherein the hydrophilic material is selected from the group consisting of microcrystalline cellulose, microfibrillated cellulose, wood pulp fiber, and combinations thereof.

38. The method of Claim 36, wherein the flash drying step includes thermally drying the slurry of the hydrophilic material at a temperature of at least 200 degrees Celsius.

39. The method of Claim 36, wherein the flash drying step includes thermally drying the slurry of the hydrophilic material at a temperature of at least 250 degrees Celsius.

40. The method of Claim 36, wherein the flash drying step includes thermally drying the slurry of the hydrophilic material at a temperature of at least 300 degrees Celsius.

41. The method of Claim 36, wherein the slurry of the hydrophilic material is subjected to flash drying for between about 0.1 and about 20 seconds.

42. The method of Claim 36, wherein the slurry of hydrophilic material has a consistency of between about 0.1% and about 10% prior to spray drying the slurry of hydrophilic material.

43. The method of Claim 36, wherein the spray drying is carried out until the slurry of the hydrophilic material reaches a consistency of between about 15% and about 80% consistency by weight.

44. The method of Claim 36, further comprising the step of subjecting the slurry of the hydrophilic material to a refining treatment prior to spray drying the slurry of the hydrophilic material.

45. The method of Claim 36, wherein the flash dried slurry of the hydrophilic material comprises at least 80% twisted fibers.

46. The method of Claim 36, wherein the flash dried slurry of the hydrophilic material comprises at least 85% twisted fibers.

47. The method of Claim 36, wherein the flash dried slurry of the hydrophilic material comprises at least 90% twisted fibers.

48. The method of Claim 36, wherein a water retention value of the hydrophilic material is at least 0.8 gram water/gram dry fiber as a result of being modified from two-dimensional to three-dimensional.

49. The method of Claim 36, wherein a water retention value of the hydrophilic material is at least 1.0 gram water/gram dry fiber as a result of being modified from two-dimensional to three-dimensional.

50. The method of Claim 36, wherein a water retention value of the hydrophilic material is at least 1.1 grams water/gram dry fiber as a result of being modified from two-dimensional to three-dimensional.

51. The method of Claim 36, wherein an average dry fiber twist count of the hydrophilic material is at least about 2.0 twist nodes per millimeter as a result of being modified from two-dimensional to three-dimensional.

52. The method of Claim 36, wherein an average wet fiber twist count of the hydrophilic material is at least about 1.5 twist nodes per millimeter as a result of being modified from two-dimensional to three-dimensional.

53. A cellulosic, fibrous material comprising hydrophilic material modified according to the method of Claim 36.

54. A cellulosic, fibrous material comprising:

a plurality of substantially individualized, dried fibers, the fibers having an average water retention value between 0.8 and 1.5 grams water/gram dry fiber, an average dry fiber twist count of at least about 2.0 twist nodes per millimeter, an average wet fiber twist count of at least 1.5 twist nodes per millimeter, and the fibers maintain at least 70% of the dry fiber twist count after rewetting the dry fiber.

55. The cellulosic, fibrous material of Claim 54, wherein the fibers have an average water retention value of at least 1.0 gram water/gram dry fiber.

56. The cellulosic, fibrous material of Claim 54, wherein the fibers have an average dry fiber twist count of at least about 2.5 twist nodes per

millimeter.

57. The cellulosic, fibrous material of Claim 54, wherein the fibers have an average wet fiber twist count of at least about 2.0 twist nodes per millimeter.